

SECTION 15185

CHEMICAL WATER TREATMENT

Edit to suit project.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cleaning (flushing) and chemical treatment of HVAC piping systems.
- B. Chemical feeder equipment.

1.2 CONTRACTOR REQUIREMENTS

- A. Notify Construction Inspector at least 24 hours (1 working day) in advance to witness cleaning (flushing) and treatment activity.
- B. Do not fill or flush piping systems until source of water supply is approved by Construction Inspector.
- C. Do not clean or chemically treat piping systems until systems have been successfully pressure tested.
- D. For discharge requirements of potable water used for flushing and water treatment, refer to Section 01325.
- E. Notify Construction Inspector immediately in the event of any accidental discharge.
- F. Do not place piping systems in service until the cleaning and chemical treatment results are approved by Construction Inspector.

1.3 CONSTRUCTION INSPECTOR REQUIREMENTS

- A. For discharge requirements of potable water used for flushing and water treatment, refer to Section 01325.
- B. Verify proper cleaning, flushing, chemical concentration and circulation.

1.4 SUBMITTALS

- A. Submit the following in accordance with Section 01300:
 - 1. Catalog data of flushing and chemical water treatment chemicals and equipment including electrical characteristics and connection requirements.
 - 2. Operation and Maintenance data on equipment, procedures, and treatment program. Include instructions on test procedures including target concentrations.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this section with minimum 10 years experience and approved by chemical manufacturer.

1.6 MAINTENANCE SERVICE/MATERIALS

- A. Provide training course for operating personnel, instructing them on installation, care, maintenance, testing, and operation of water treatment system. Arrange course at start up of system.
- B. Provide sufficient chemicals for treatment and testing during warranty period.

PART 2 PRODUCTS

2.1 PRODUCT SUBSTITUTION

- A. Refer to Section 01630.

2.2 MATERIAL SAFETY DATA SHEETS

- A. Material Safety Data Sheets for chemical products must be maintained on site by Contractor.

2.3 CHEMICALS

All chemicals must be identified in LANL's NPDES permit application and lanl's waste profile form (wpf) as potential contaminants of concern. Consult with ESH-18.

- A. System Cleaner:
 - 1. Manufacturer: Garratt-Callahan, Formula 248L.
 - 2. Description: Alkaline liquid blend of phosphates, silicates, iron oxide chelants, dispersants, and surface active agents.
- B. Closed System Treatment (hot water heating systems and chilled water systems):
 - 1. Manufacturer: Garratt-Callahan, Formula 1015L.
 - 2. Description: Corrosion and scale inhibitor based on phosphorate and orthophosphate.
- C. Open System Treatment (cooling towers, evaporative condensers, air washers, fluid coolers):
 - 1. Manufacturer: Garratt-Callahan, Formula 227L or 2011.
 - 2. Description: Liquid blend of scale inhibitors, crystal modifiers, antifoulants, and corrosion inhibitors.
- D. Steam Boiler Treatment:
 - 1. Manufacturer: Garratt-Callahan, Formula 1152.
 - 2. Description: Liquid all-polymeric scale corrosion inhibitor.

2.4 BY-PASS (POT) FEEDER

- A. Manufacturer: Garratt-Callahan, No 5018.

- B. 5 gallon, quick opening cap, for working pressure of 175 psig.

Items in sections 2.5 - 2.11 are used in treatment for open cooling towers. Refer to mechanical standard drawing ST6800.

2.5 CHEMICAL CONTROL SYSTEM (OPEN COOLING TOWER)

- A. Manufacturer: Garratt-Callahan, No. 21-161-FS-CR with No. 16-161 conductivity controller, and No P151-393-TI chemical pumps.
- B. Prefabricated package, prewired and preplumbed, consisting of a 0-1000M F mhos conductivity controller, epoxy coated steel enclosure, size 48 in. long x 30 in. high x 12 in. deep, and lockable double door, two chemical pumps, chemical injection manifold for one pump, two injectors, 50 feet of 3/8 in. PE plasting tubing and a 15 amp/120V duplex receptacle for incoming power.

2.6 BROMINATOR

- A. Manufacturer: Garratt-Callahan, No. SC-10-10.
- B. Factory assembled with flowmeter, drain valve, inlet and outlet valves, and base.

2.7 CHEMICAL SOLUTION DRUMS

- A. Manufacturer: Garratt-Callahan, No. 5016.
- B. Two 50 gallon polyethylene drums, self supporting, graduated markings, with moulded cover.

2.8 SEPARATOR

- A. Manufacturer: Lakos, No. TC-[]-CRS or AXL-[].
- B. Steel construction, rated at 150 psig, flanged connections. Flow range [] gpm.

2.9 SOLENOID VALVE (SEPARATOR DRAIN & MAKE-UP WATER)

- A. Manufacturer: CLA-VAL, No. 136G-01A.
- B. Brass body, globe valve, slow opening, rated for continuous flow of 125 gpm at 20 fps.
- C. Electrical characteristics: 120V, single phase, 60 Hz.

2.10 WATER METER

- A. Manufacturer: Badger, No. RCDL-M120.
- B. Positive displacement meter, bronze housing, flow rates 2-120 gallons of cold liquids at 32 degree F to 120 degree F, 150 psig maximum operating pressure with non-resettable register. Meter size 1 1/2 inches.

2.11 FLOW METER

- A. Manufacturer: PeekPolysonics, Model BFM 91.
- B. Doppler ultrasonic flow meter, noninvasive, digital display of rate (gpm) and total flow

(gallons), 4-20 mA output signal, 120V, single phase, 20-foot standard cable length, accuracy within plus or minus 2 percent of full scale, NEMA 4X thermoplastic housing, for use on [SCH 40 pipe], standard flow range 1-10 fps.

PART 3 EXECUTION

3.1 PREPARATION

- A. Operate, fill, start and vent system prior to cleaning. Use water meter to record capacity in each system.

3.2 CLEANING

- A. Concentration: As recommended by manufacturer.
- B. Circulation:
 - 1. Circulate cleaning solution for minimum of 72 hours throughout entire piping system including system equipment, then drain.
 - 2. Refill with clean water and repeat until system cleaner is removed.
 - 3. Remove, clean, and replace strainer screens.
 - 4. Ensure water filters, instrumentation, gages, flow transmitters, and similar items are removed or protected. Provide a temporary bypass or plugs as required.
 - 5. Process Cooling Water systems: Provide a 4 foot long hose interconnected between supply and return connection at each service drop. This hose will be utilized for circulation and remains property of LANL.

3.3 CHEMICAL TREATMENT

- A. Concentration: As recommended by manufacturer.
- B. Provide one bypass feeder on each closed system and steam system to introduce treatment.
 - 1. Closed System: Install around balancing valve downstream of circulating pumps unless indicated otherwise.
 - 2. Steam System: Install on feed water line to each boiler.
- C. Construction Inspector will verify phosphate concentration, conductivity, and PH of solution treatment.

END OF SECTION